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Analytical Approximations

Volume 8

Cecil Hastings, Jr.
James P. Wong, Jr.

P-376 ✓

2 March 1953 *Ben*

Approved for OTS release

6p

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Analytical Approximation

Bessel Function of Imaginary Argument: To better than
.0005 over $(1, \infty)$,

$$e^{-x} I_1(x) \doteq \frac{x}{\sqrt{5.3 + 7.7x + 3.9x^2 + 2\pi x^3}}.$$

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James P. Wong, Jr.
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Analytical Approximation

Bessel Function of Imaginary Argument: To better
than .00006 over $(2, \infty)$,

$$e^{-x}I_1(x) \doteq \frac{x}{\sqrt{10.69 + 3.32x + 4.68x^2 + 2\pi x^3}}.$$

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Analytical Approximation

Bessel Function of Imaginary Argument: To better
than .000,008 over $(4, \infty)$,

$$e^{-x}I_1(x) \doteq \frac{x}{\sqrt{10.96 + 2.82x + 4.78x^2 + 2\pi x^3}} .$$

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Analytical Approximation

Bessel Function of Imaginary Argument: To better
than .0006 over $(0, \infty)$,

$$e^{-x}I_0(x) \doteq \sqrt{\frac{1 + .297x + .341x^2}{1 + 2.333x + 2.137x^2 + 2.096x^3}}.$$

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Analytical Approximation

Bessel Function of Imaginary Argument: To better than .00016 over $(2, \infty)$,

$$e^{-x} I_0(x) \doteq \frac{1}{\sqrt{2\pi x}} \left\{ 1 + \frac{.120}{x} + \frac{.136}{x^2} \right\}.$$

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